

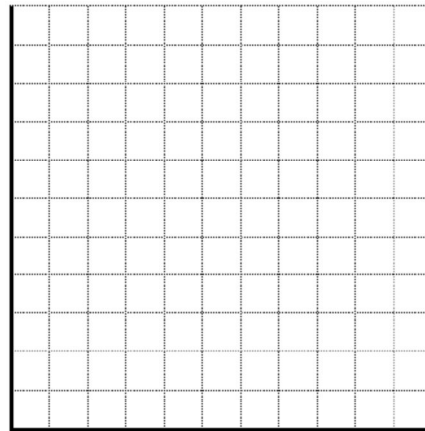
Direct Variation

Susan can jog at a steady pace of 150m/min

1. Complete the table of values below

Time (min)	Distance (m)
0	
1	
2	

2. Graph this relationship



-Is the data continuous or discrete?
If it's continuous you should **connect the dots**.

-remember independent on horizontal **x-axis**

3. Identify the independent/dependent variables.

4. Describe the shape of the graph. Where does it intersect the vertical axis?

5. Write an equation to find the distance, d , in metres, that Susan jogs in t mins.

words:

6. Use the equation to determine the distance that Susan can jog in 25 mins.

7. How long would it take Susan to jog 3 km (3000 m)? Substitute 3000 for d in your equation and solve for t , using algebra.

8

Consider the distance Susan jogged in 5 minutes. What happens to this distance when the time is doubled? What happens to the distance when the time is tripled?

Direct Variation is a relationship between two variables in which one variable is a **constant multiple** of the other variable. *One thing directly affects the other thing.* If the independent variable increases or decreases, the dependent variable will change by a common factor (m). The two variables are **proportional** to each other.

- Direct Variation occurs when the **dependent** variable varies by the same **factor** as the **independent** variable.

TIME (s)	DIST(M)
0	0
1	10
2	20
3	30
4	40

- Direct variation can be defined by the equation:

Note: the value 'm' is your **constant of variation**



What would the graph look like?

In a direct variation, when the independent value is at 0, the dependent value is at 0.

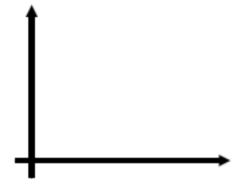


Table 1

Time (h),t	Cost (\$),c
0	40
1	50
2	60
3	70
4	80

Both tables represent linear relations. **Which table represents a direct variation..** and how do you know?

table 2

Time (h),t	Cost (\$),c
0	0
1	30
2	60
3	90
4	120

Task #1: The Fredrick family drives 250 km to a relative's home, driving at a constant rate of 86 km/hr.. The distance, d, in km, varies directly with time, t, in hours.

- a. Find the relationship relating d and t in **words** and then write the **equation**.

- b i) Use the equation to find how far they will drive in 2 hours.

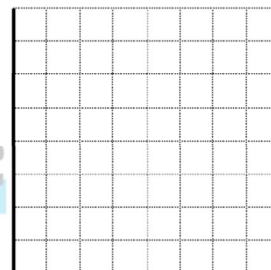
- b ii) Use the equation to find algebraically how long it will take the Fredricks to reach their destination.

Task #2: Justin works part-time at a local sports store. He earns \$7.50/h.

- a. Create an equation which describes the relationship between his pay, in dollars, and the time, in hours, he works.

- b. Complete the **table** and **graph** the relation.

Time Worked	0	2	4	6	8
Pay					

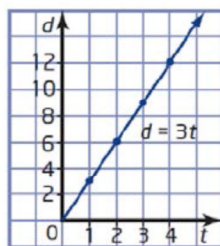
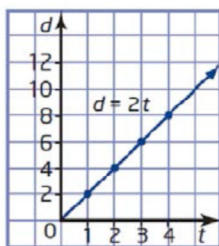




Task #3: Indicate whether the equation represents a direct variation and explain how you know.

Equation	Direct Variation? YES or NO	Justification
$A = 2C + 5$		
$A = 2C$		

Task #4: Consider the graphs of $d = 2t$ and $d = 3t$. Are these relationships *direct variation*? How do you know?



Task #5: The cost, c , in dollars, of building a concrete sidewalk varies directly with its length, s , in metres. The cost of every metre of sidewalk (including materials and labor) is \$22.50.

a) Find the relationship between C and s in words and then find the equation.

b) Use the equation to find the cost of a 700 m sidewalk.

c) Use the equation to find the length of sidewalk one could build with \$1 012.50.

1. Indicate whether the following relationships are varied directly or not.

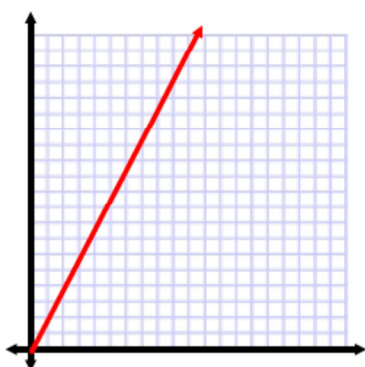
a) $C = 15n$

b) $y = 20x + 10$

c) $E = 25h$

2. Indicate whether the following relationships are varied directly or not.

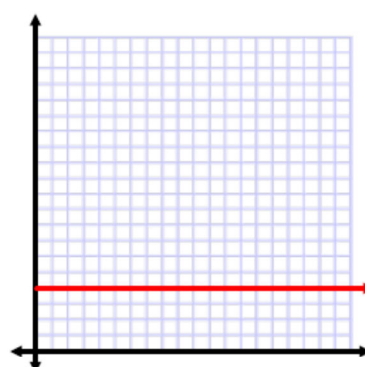
a)



b)

time (h)	distance (km)
0	25
1	50
2	75
3	100
4	125
5	150

c)



3. Determine the equation for each of the following situations. Say what your variables represent.

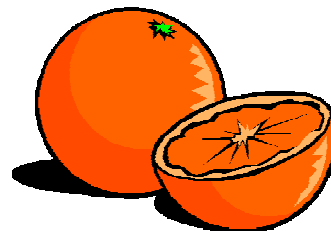
a) The distance travelled by a bus driving at a constant speed of 80 km/h varies directly with time.

b) The total cost varies directly with the number of \$7 books bought.

c) The volume of water varies directly with time. The volume of water increases at a steady rate of 100 litres per minute.

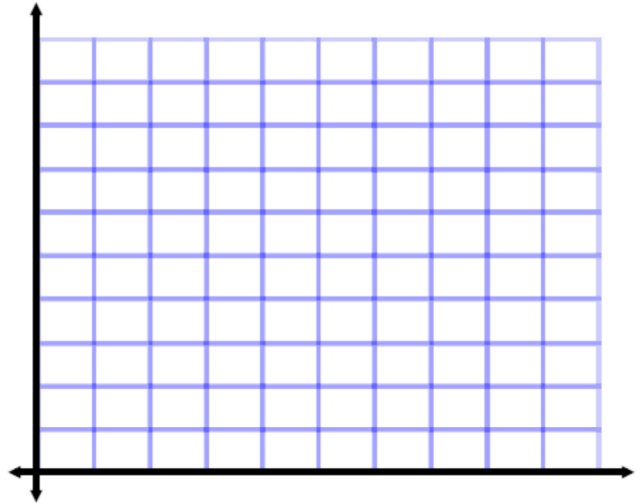
4. The cost of oranges varies directly with the total mass of the oranges, which cost \$2.25 per kilogram.

- Describe the relationship in words.
- Write an equation relating the cost and the mass of the oranges.
- What is the cost of 30 kg of oranges?
- How many kg of oranges can you buy with \$56.25?



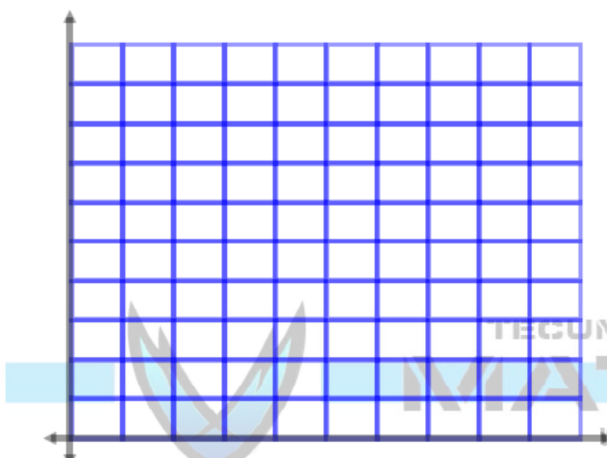
- 5 Passent's pay varies directly with the time, in hours, she works. She earns \$8/h.

- Choose appropriate letters for variables. Make a table of values showing Passent's pay for 0 h, 1 h, 2 h, and 3 h.
- Graph the relationship.
- Write an equation in the form $y = mx$



- 6 A parking garage charges \$2.75/h for parking.

- Describe the relationship between the cost of parking and the time, in hours, parked.
- Illustrate the relationship graphically (you'll need to make a table of values first) and then write the equation.
- Use your graph to estimate the cost for 7 h of parking.
- Use your equation to determine the exact cost for 7 h of parking.





Y are you so sad, math book?



I have a lot of problems...

